

TYPE I PROGRESS REPORT

March 1 - April 30, 1973

a. Land Use Management in Minnesota #283.

b. Joseph E. Sizer (ST-360).

c. We have encountered difficulty in obtaining the proper forms for reimbursement for work carried out to date (see item 1 of attached letter of April 25th). Receipt of bulk imagery still averages about 6 weeks lag. Some backlogs of orders have been coming in. However, most of the retrospective request material are border areas of Minnesota and we are lacking bulk black & white and bulk color composites for much of the middle part of the state. We have sent a request to NDPF to trace several very early orders that have not been received.

d. This project is aimed at evaluating ERTS-1 imagery for updating and adding detail to the Minnesota Land Management Information System (MLMIS).

Work in this reporting period has been directed toward urban, forest, extractive, and cultivated land classes. A full-scale test of the step by step process of going from bulk images to data entry into the MLMIS has also begun. The test area is Itasca County, Minnesota. For purposes of testing at least second level classifications will be used. For some broad classes third level classification will be used.

This county is one for which we have substantial ground truth in the data system. State and regional attention is focused on this county because of its well developed information system and the interest shown by local resource and data management personnel. Only data-using decision makers are able to provide an adequate test of the value of ERTS-1 land information data. The Itasca County test will provide a basis for procedural improvement and evaluation. This test will be an important part of the work during the next reporting interval and should be completed shortly thereafter.

Tests to determine threshold of urban areas have been carried out in three areas of the state, the Northwest, South-central, and Southeast. Band 7, bulk 70mm imagery was used for each area and all three scenes were snow covered. The results obtained are shown in the following table.

	Easily Identified		Difficult to	Not
	Identifiable CBD	No Visible CBD	Identify	Identifiable
Number of Towns	6	116	31	80
Size Range (1970 Population)	7607-53,983	80-4774	All below 133	All Unincorporated places. No population listed.

N73-23442

Unclas  
00581

CSCL 08B G3/13

(E73-10581) LAND USE MANAGEMENT IN  
MINNESOTA Progress Report, 1 Mar. - 30  
Apr. 1973 (Minnesota State Planning  
Agency, St. Paul.) 6 p HC \$3.00

All cities and villages that could be located on the bulk 70mm transparencies when projected at a 1:125,000 scale without prior knowledge of their existence were classed as easily identified. All villages that could be found only with a priori knowledge of their locations were classed as difficult to identify. Unidentifiable villages were those places whose presence could not be detected on the image even with knowledge of their exact location.

In rough population terms the easily identifiable places account for over 97.5 percent of the nucleated population in the sample areas. Difficult to identify nucleated settlements account for only about 1.5 percent while the unidentifiable account for less than 1 percent of the nucleated settlement population.

Those findings indicate the threshold of nucleated settlement detection under the conditions of the test to be on the order of ten to twenty dwellings. With the low sun angle, snow-covered imagery, no variations in ease of detection could be distinguished among the three test areas.

Additional tests of one township in Polk County (Northwestern Minnesota flat Lake Agassiz Plain) indicate that 54 of the 95 rural farmsteads could be identified with the low sun angle, snow-covered imagery.

Metropolitan Twin Cities mapping has been completed and sampling procedures for evaluation are now being set up for field verifications of interpretation.

Extractive land classification and mapping of the Iron Range test area has been completed and mapping area and classification accuracy need to be evaluated in the next reporting period.

Classification of agricultural land has thus far centered around manual interpretation of fall plowed ground for two to three time periods in Jackson and Nicollet counties. The use of electronic density slicing techniques are also being tested to ease discrimination and maximize uniformity of interpretation across the image. Spring and summer plowing will also be continually monitored as the imagery is received. It is believed that the summation of cultivated land based on monitoring the newly plowed ground will be the most useful and accurate means for separating cultivated from non-cultivated agricultural land.

f. No technical reports or papers have been completed in this reporting time interval.

g. Minor changes in the investigative effort are foreseen at this time necessitating extension of time so that we can complete the agricultural, wetlands, and water studies using a full crop and hydrologic year of data for analysis. This extension implies no increase in the funding level, but is necessary because of the impact launch delays have had on monitoring agricultural land and hydrologic systems.

Extension is also essential for carrying to completion full scale systems tests of selected areas (such as Itasca County), for cost/benefit evaluation, and procedural improvement (see item 2 of attached April 25th letter).

- h. No changes have been made in the standing order form.
- i. ERTS Image Description forms are attached.
- j. Two data request forms were filed during the period of 3/18/73 and 3/21/73.
- k. The only budgetary changes forseen at this time are the time extension described in g. above.
- l. No personnel changes have occurred.

# ERTS IMAGE DESCRIPTOR FORM

(See Instructions on Back)

DATE May 7, 1973

PRINCIPAL INVESTIGATOR Joseph Sizer

GSFC S 360

ORGANIZATION Minnesota State Planning Agency

NDPF USE ONLY

D \_\_\_\_\_  
N \_\_\_\_\_  
ID \_\_\_\_\_

PRODUCT ID (INCLUDE BAND AND PRODUCT)	FREQUENTLY USED DESCRIPTORS*			DESCRIPTORS
1057-16320; Bands 4,5,6, 7				Urban areas, Agriculture
1075-16321; Bands 4567				Urban areas, Agric.
1129-16325 Bands 457				Urban areas, Agric.
1165-16232 Bands 5,7				Urban areas, Agric.
1201-16325 Bands 4567				Urban areas, Agric.
1148-16374 Bands 4567				Mining
1202-16375 Bands 4567				Mining
1166-16373 Bands 5,7				Mining
1131-16430 Bands 4567				Marshes, Bogs
1149-16430 Bands 5,7				Marshes, Bogs
1167-16430 Bands 4567				Marshes, Bogs
1185-16425 Bands 4567				Marshes, Bogs
1166-16382 Band 7				Towns
1146-16270 Band 7				Towns
1168-16485 Band 7				Towns

\*FOR DESCRIPTORS WHICH WILL OCCUR FREQUENTLY, WRITE THE DESCRIPTOR TERMS IN THESE COLUMN HEADING SPACES NOW AND USE A CHECK (✓) MARK IN THE APPROPRIATE PRODUCT ID LINES. (FOR OTHER DESCRIPTORS, WRITE THE TERM UNDER THE DESCRIPTORS COLUMN).

MAIL TO ERTS USER SERVICES  
CODE 563  
BLDG 23 ROOM E413  
NASA GSFC  
GREENBELT, MD. 20771  
301-982-5406



# STATE OF MINNESOTA

STATE PLANNING AGENCY  
802 CAPITOL SQUARE BUILDING  
550 CEDAR STREET  
ST. PAUL, 55101

April 25, 1973

Mr. Robert Phillips  
ERTS Contracting Officer  
Code 245  
Goddard Space Flight Center  
Greenbelt, Maryland 20771

Dear Mr. Phillips:

I would like to bring to your attention two matters of great importance to our ERTS Contract (#NAS 5-21801 Minnesota Land Use Management).


1. To date we have not received the proper forms for contract payment. We have been operating on State funds, but they have already run out for the fiscal year. Could you please see that the proper forms are forwarded to me as soon as possible.
2. We request an extension in the ERTS-1 contract through December 31, 1973. This request is based on the need to analyze a complete growing season. This was originally planned under the original proposal; but, the delays in the ERTS-1 launch precluded the possibility during the 1972 calendar year.

By June 1973, we will have completed evaluation of ERTS-1 imagery for several major classes of land use (urban, extractive, forests, and some types of wetlands) and reports will be filed by that time. However, water, wetlands, and agricultural applications of ERTS-1 imagery can only be properly evaluated when examined on a complete hydrologic or cropping year basis. Full season information for these groups of land use is necessary to establish the validity of the data in the same way that it would be used by state agencies.

This request for extension implies no additional funding from NASA and is based on the time period for data collection, experienced data receipt lage, and analysis time. The extension will also allow a larger scale test of costs effectiveness of data from ERTS.

We would greatly appreciate your immediate response on these two items.

Sincerely,

A handwritten signature in cursive script, appearing to read "Joseph E. Sizer".

Joseph E. Sizer, Principal Investigator  
Director, Environmental Planning

JES:dk